

$\frac{3}{16}$ (New) An apparatus according to claim $\frac{1}{2}$ further comprising an addition circuit which adds to each other the signals from a plurality of the pixels adjacent to each other.

$\frac{4}{18}$ (New) An apparatus according to claim $\frac{1}{2}$, wherein the amplification element and the first load element construct a source follower, and the amplification element and the second load element constitute a source follower circuit.

$\frac{5}{18}$ (New) An apparatus according to claim $\frac{1}{2}$ wherein said plurality of first load elements are arranged between said photoelectric conversion area and said first horizontal output line, and said plurality of second load elements are arranged between said photoelectric conversion area and said second horizontal output line.

REMARKS

Claims 3 and 15-18 are now under examination; Claims 1, 2, 7-10, 12 and 14 have been withdrawn from consideration.^{1/} Of the claims under consideration, Claim 3 has been amended to define still more clearly what Applicant regards as his invention, in terms which distinguish over the art of record. Claims 4-6, 11 and 13 have been canceled without prejudice or disclaimer of subject matter. Claims 15-18 have been added to assure Applicant of a full measure of protection of the scope to which he deems himself entitled. The title has been amended to make it more descriptive, as required in the Office Action.

^{1/} Applicant wishes to note that, contrary to the statement at paragraph 1 of the Office Action, he did not traverse the election-of-species requirement.

Of the claims under consideration, Claim 3 is independent.

Claims 3, 4, 6 and 11 were rejected under 35 U.S.C. § 103(a) as being obvious from U.S. Patent 5,698,844 (Shinohara et al.) in view of U.S. Patent 6,049,357 (Shinohara), and Claim 5 was rejected under Section 103(a) as being obvious from those two patents, further in view of U.S. Patent 5,536,932 (Hack et al.).

First, cancellation of Claims 4-6 and 11 renders the rejections of those claims moot.

Independent Claim 3 is directed to an image pickup apparatus that comprises a photoelectric conversion area, in which a plurality of pixels are two-dimensionally arranged in horizontal and vertical directions, each of the pixels including a photoelectric conversion element and an amplification element which amplifies a signal from the photoelectric conversion element to output the amplified signal. The apparatus also has a plurality of first vertical output lines which output sequentially signals from the pixels arranged in the vertical direction, and a plurality of second vertical output lines which output sequentially signals from the pixels arranged in the vertical direction. A first horizontal output line outputs sequentially the signals from the first vertical output lines, and a second horizontal output line outputs sequentially the signals outputted from the second vertical output lines. The first horizontal output line is arranged on a side of a first side of photoelectric conversion area, and the second horizontal output line is arranged on a side of a second side of the photoelectric conversion area, the first and second sides of the photoelectric conversion area being opposite to each other in the vertical direction. A plurality of first load elements are also present, and at least one first load element is arranged to each of the first vertical output lines. In addition, at least one of a plurality of

second load elements is arranged to each of the second vertical output lines. Also, the first load elements are arranged at a first horizontal output line side of the plurality of first vertical output lines, and the second load elements are arranged at a second horizontal output line side of the plurality of vertical output lines.

Thus, among other important features recited in Claim 3, is the relationship in arrangement between horizontal and vertical output lines (an example is shown in Fig. 5; it will be understood of course that the scope of the claims is not limited to the details shown in that Fig., or described in the specification). As is clearly recited in Claim 3, an image pickup apparatus includes first and second vertical output lines which output signals of pixels respectively to first and second horizontal output lines which are arranged on different sides of a photoelectric conversion area, opposite to each other in a vertical direction. In addition, Claim 3 also clearly recites that the first and second vertical output lines include first and second load elements respectively, which are arranged on respective different sides correspondingly to the first and second horizontal lines. These features of Claim 3 are not taught or suggested by *Shinohara '844* and *Shinohara '357*, taken separately or in combination (assuming such combination to be permissible).

Shinohara '844 relates to a solid-state image sensing device, as shown in Fig. 1. That device, however, does not teach or suggest first and second vertical output lines arranged as recited in Claim 3.

Shinohara '357 also relates to an image pickup apparatus, but also fails to teach or suggest the mentioned feature (first and second vertical output lines arranged as recited in Claim 3), as well as the recited relationship in position between first and second horizontal output lines and the first and second vertical output lines. This patent shows

rather a plurality of vertical output lines and one horizontal output line (Fig. 4, for example).

Even if it is deemed permissible to combine these two patents in the manner proposed in the Office Action, the result would not have the recited arrangement of first and second vertical output lines. For at least that reason, Claim 3 is believed to be clearly allowable over those two patents, considered separately or in any permissible combination.

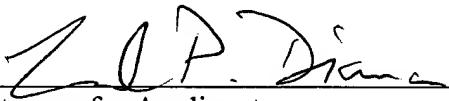
A review of the other art of record has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against independent Claim 3, and that claim is therefore believed patentable over the art of record.

The other claims under examination in this application are each dependent from independent Claim 3, and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration or reconsideration, as the case may be, of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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GNEMON 332207 v1

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

3. (Amended) [A photoelectric conversion] An image pickup apparatus comprising:

a photoelectric conversion [elements] area in which a plurality of pixels are two-dimensionally arranged [on a plurality of rows] in horizontal and vertical directions, wherein each of said of plurality of pixels includes a photoelectric conversion element and an amplification element which amplifies a signal from said photoelectric conversion element to output the amplified signal;

a plurality of first vertical output lines which output sequentially signals from the pixels arranged in the vertical direction;

a plurality of second vertical output lines which output sequentially signals from the pixels arranged in the vertical direction;

a first horizontal output line which outputs sequentially the signals from said plurality of first vertical output lines; and

a second horizontal output line which outputs sequentially the signals outputted from said plurality of second vertical output lines,

wherein said first horizontal output line is arranged on a side of a first side of said photoelectric conversion area, said second horizontal output line is arranged on a side of a second side of said photoelectric conversion area, and said first side and said second side of said photoelectric conversion area are opposite to each other in the vertical direction;

[amplification means, including load means arranged in units of vertical output lines, for amplifying signal charges accumulated in the photoelectric conversion elements arranged in the plurality of rows;

vertical scanning means for sequentially scanning signals amplified by said amplification means to read the signals onto the vertical output lines; and

horizontal scanning means for sequentially scanning the signals amplified by said amplification means to read the signals onto horizontal output lines,]

a plurality of first load elements, wherein at least one first load element is arranged to each of said plurality of first vertical output lines; and

a plurality of second load elements, wherein at least one second load element is arranged to each of said plurality of second vertical output lines,

wherein said [load means are located on vertically the same side as a direction of outputting the signals from said amplification means, and some of the signals from said amplification means are output in an opposite direction to the direction of signal output] plurality of first load elements are arranged at a first horizontal output line side of said plurality of first vertical output lines, and said plurality of second load elements are arranged at a second horizontal output line side of said plurality of vertical output lines.

4. - 6. (Canceled)

11. (Canceled)

13. (Canceled)

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO SPECIFICATION

The Title, starting at page 1, line 1, ending at page 1, line 1 has been amended as follows.

PHOTOELECTRIC CONVERSION APPARATUS WHICH AVOIDS
CERTAIN SHADING EFFECTS